

## CLAIMS

1. A dunnage making machine, comprising: an upstanding support post, means for rotatively supporting a roll of paper in a horizontal position on one side of the post, a forming bar at the upper end of the post with pair of downwardly curved end sections which are spaced apart by a distance less  
5 than the width of the paper for rolling down the edge portions of the paper as the paper is drawn over the bar, an arm extending from the side of the post opposite the paper, a crumpling head mounted on the arm, a throat section mounted on the arm between the post and the crumpling head for receiving the paper from the forming bar and urging the edge portions of the paper  
10 toward each other and causing them to gather, a roller within the head for pressing the gathered paper to crumple it, and a knife within the head for perforating the crumpled paper along a serrated tear line.
2. The dunnage making machine of Claim 1 including a second throat section positioned between the first named throat section and the crumpling roller for gathering the central portion of the paper and further gathering the edge portions.
3. The dunnage making machine of Claim 1 wherein the knife comprises a plurality of blades mounted in zig-zag fashion on a mandrel which rotates about an axis with the blades in periodic engagement with the surface of a support roller.
4. The dunnage making machine of Claim 3 wherein the knife blades have cutting edges with an elliptical profile.
5. The dunnage making machine of Claim 3 wherein the support roller is fabricated of ultra high molecular weight polyethylene.
6. A machine for crumpling paper to make dunnage, comprising: a forming bar having a pair of curved end sections which are spaced apart by a distance less than the width of the paper so that the edge portions of the paper tend to be rolled toward each other as the paper is drawn across the  
5 forming bar, a first throat section having an opening of substantially lesser dimension than the spacing between the end sections of the forming bar for

10 further rolling the edge portions toward each other and gathering them for crumpling, a second throat section having an opening of lesser dimension than the first throat opening for gathering the central portion of the paper and further gathering the edge portions, and a pair of rollers engagable with opposite sides of the paper for drawing the paper over the forming bar and through the throat openings, then pressing the gathered portions together.

7. The machine of Claim 6 wherein the rollers are of lesser width than the throat openings and tension only the central portion of the paper as the paper is drawn across the forming bar and through the openings.

8. The machine of Claim 6 including knives for perforating the crumpled paper along a serrated line.

5 9. A machine for making paper dunnage, comprising: means for feeding paper along a path, means for drawing edge portions of the paper together and gathering the paper as it is fed along the path, a crumpling roller engagable with the gathered paper, and a knife for perforating the paper along longitudinally spaced, laterally extending serrated lines.

5 10. The machine of Claim 9 wherein the knife comprises a cylindrical mandrel oriented with its axis generally perpendicular to the path of the paper and having at least one flat side which is tangential to the axis, and a plurality of blades mounted on the flat surface in zig-zag fashion along a line parallel to the axis for periodic engagement with the paper as the mandrel rotates about its axis.

11. The machine of Claim 10 further including a support roller rotatable about an axis parallel to the axis of the knife mandrel with a surface which supports the paper for engagement by the knife blades.

12. The machine of Claim 10 wherein the support roller is fabricated of ultra high molecular weight polyethylene.

13. The dunnage making machine of Claim 10 wherein the knife blades have cutting edges with an elliptical profile.

14. A method of making paper dunnage, comprising the steps of: drawing a web of paper across a forming bar with curved end sections to roll the edge portions of the paper, drawing the paper through a throat section to urge the rolled edge portions toward each other and cause them to gather, pressing the gathered paper with a roller to crumple it, and perforating the crumpled paper along a serrated tear line.
15. The method of Claim 14 wherein the paper is draw over the forming bar and through the throat section by engaging the central portion of the paper with a roller of lesser lateral extent than the throat section so that only the central portion of the paper is tensioned by the roller.
16. The method of Claim 15 wherein the paper is drawn over the forming bar and through the throat section by the crumpling roller.
17. The method of Claim 14 wherein the paper is perforated along the serrated line by engagement with knife blades mounted in a zig-zag pattern on the surface of a rotating mandrel.
18. A method of making paper dunnage, comprising the steps of: drawing a web of paper across a forming bar with curved end sections to roll the edge portions of the paper, drawing the paper through a first throat section to urge the rolled edge portions toward each other and cause them to gather, drawing the paper through a second throat section of lesser dimension than the first to gather the central portion of the paper and further gather the edge portions, and pressing the gathered paper with a roller to crumple it.
19. The method of Claim 18 including the additional step of perforating the crumpled paper along a serrated tear line.